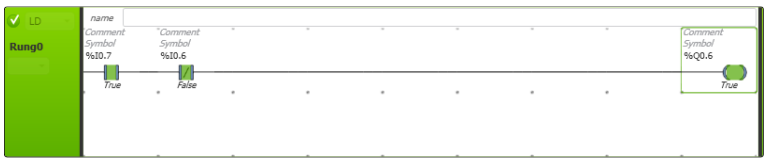
Looking at the Program

Displaying Values on a Rung

When SoMachine Basic is connected to the M221, the values of objects are displayed on rungs. If an output does not turn on when expected, the logic can be checked and the cause determined.

The colouring of the contacts will indicate power flow. Green colouring shows when a contact will allow power to flow and a contact that is not coloured will not allow power flow.

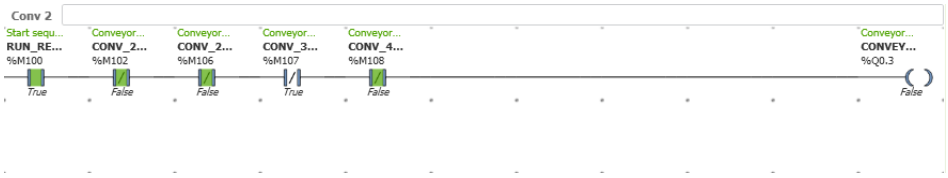


The state shown under each object also gives the state of the contact or coil, showing whether it is true or false.

Note:

The True/False indication shows the state of the input, not the state of the coil or contact. The green colouring shows the state of the contact. This can be confusing for inverted contacts and coils but a green colour will always signify power or on.

Analysing a Rung



In the above example the outputs controls conveyor 2 which is not running. Looking at the displayed values on the rung, %M100 which is the Run Relay is shown as true so the conveyor should be running. However, %M107 which is Conveyor 3 fault is also shown as true and no power will be allowed through this normally closed contact.

Even though there is no fault on conveyor 2, the fact that another conveyor has developed a fault will also stop this one. The program has been designed to behave this way. This method of analysing a rung can be helpful to determine why something is not happening as expected, especially when it is being prevented by something in another part of the program.

Exercise - Values in Rungs

Learning Outcomes

By the completion of this exercise you will:

- Use the values in displayed in rungs to fault find the program

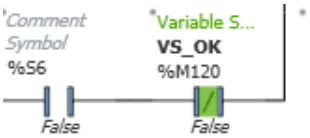
1 If SoMachine Basic is not running, start it and open the Conveyor Control Application.

2 Investigate why the fault light is flashing.

i. Display the **Fault Light** rung located in the **Fault Handling** POU.

ii. Identify the part of the rung that is causing the fault light to flash.

This leg contains %S6 which is the system bit cycling with a 1 second interval. This is in series with **%M120** the normally closed contact is false which is causing the fault light to flash.

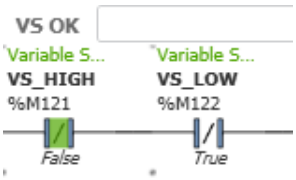


The symbol for this is **VS_OK**.

Exercise - Values in Rungs (cont.)

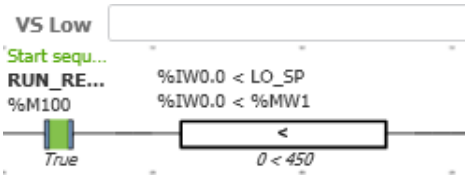
iii. Display the **VS OK** rung located in the **Speed Monitoring** POU.

The VS_OK object is turned on when the speed is not low and not high. Looking at the state of the two contacts, the VS_LOW contact is true so the low speed means that the speed is not OK.



iv. Display the **VS Low** rung located in the **Speed Monitoring** POU.

The Run Relay (%M100) is true so the error must be in the comparison. The variable speed low setpoint (VS_VO_SP) is 400 but the actual speed of conveyor 1 (C1_SPD) is equal to one. The comparison is successful and the low speed turns on.



The conveyor is either not running or there is no signal from the device monitoring the conveyor speed.

(In this case, the signal is not connected)